

REMARKS

Claims 1, 3, 5, 7, 9, 13-14, 21-22, 25, 30 and 32-34 are amended. Claims 8, 10-12, 16, 26-29 and 31 are canceled. Therefore, claims 1-7, 9, 13-15, 17-25, 30 and 32-34 are pending.

Specification Objection

Claims 27 and 30-34 were objected to because the term “tangible” is not defined in the specification. Accordingly, the term “tangible” has been removed from the claims, and the objection is now moot.

U.S.C. 35 §101 Rejection

Claims 27-34 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Specifically, the claims were objected to as possibly covering a carrier wave. Claims 27-29 and 31 are canceled. Claims 30 and 32-34 are amended to recite a computer-readable storage medium, which excludes carrier waves and is therefore statutory. Accordingly, Applicants believe the U.S.C. 35 §101 rejection has been addressed and should be withdrawn.

U.S.C. 35 §102(e) Rejection

Claims 1-34 were rejected under 35 U.S.C. §102(e) as being anticipated by Shiomi et al., U.S. Publication number 2006 0095919 A1 (“Shiomi”). In response, independent claims 1, 14, 21, 25, 30 and 32-34 are amended. The claims depending from independent claims 1, 14, 21, 25, 30 and 32-34 are also amended to reflect the changes to their respective independent claims.

According to MPEP 2131, “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants respectfully submit that Shiomi does not describe each and every element of the amended claims, as will be discussed in the remarks below.

Shiomi generally describes a library unit that provides resources to a requesting application, acquires an ID for the requesting application, and stores a combination of the resource name of the provided resource and the application ID in a table. When the

application has completed, the library unit receives the application ID of the completed application, uses its table to match the application ID to a resource name, and collects the resource (Shiomi, abstract). Shiomi discusses exactly five embodiments of this general concept:

- 1) library units directly collecting resources to provide to an application, and registering a callback function to be called when an application is completed or suspended to collect the allocated resources (Shiomi, first embodiment [0078][0106]),
- 2) library units generating a resource collection instance to collect allocated resources when an application is completed or suspended (Shiomi, second embodiment [0106]),
- 3) an application execution apparatus that generates threads to reserve resources and an OS unit that collects unwanted resources based on the generated threads when an application is completed (Shiomi, third embodiment [0123]),
- 4) a library unit itself executing the tasks of providing, administrating, and collecting the resources (Shiomi, fourth embodiment [0166]-[0167]), and
- 5) an application execution apparatus including a divided heap area (i.e., a section of memory) for each application to store objects/resources relating to the specific application, and a memory heap management unit for administrating the divided heaps (Shiomi, fifth embodiment [0189]-[0190]).

CLAIMS 1-7, 9 and 13

Claim 1 is amended to recite:

- the limitation “the tag identifying the allocated kernel resources charged to the process.” Support for this amendment may be found in the specification 8:9-11, 9:21-23, and 10:2-6.
- the elements “determining if the process is a kernel process, determining if the process is a user process, flagging the tag with a kernel flag bit if the process is determined to be a kernel process, and flagging the tag with a user flag bit if the process is determined to be a user process.” These elements are broken out to address the use of the operator “or” from the original claim wording as pointed out in the Office action. Support for the addition of “bit” may be found in the specification 9:9-16.

- the elements “determining if the process has exceeded a threshold limit of kernel resource usage; and if the process has exceeded the threshold, aborting the process.” Support for this amendment may be found in the specification 14:23-15:7 and Figure 7.

Dependent claims 2-7, 9 and 13 are amended to reflect the changes to amended claim 1. Dependent claim 5 is also amended to correct antecedent usage.

Applicants submit that Shiomi does not appear to disclose the first three elements of amended claim 1: “generating a tag to charge a process allocated with kernel resources, the tag identifying the allocated kernel resources charged to the process; determining if the process is a kernel process; determining if the process is a user process.”

The Advisory Action, page 2 under the heading “As per claim 1” stated that “Shiomi’s reference discloses in (FIG. 1) an identifier providing unit 13c included in the kernel unit 13 for providing ID tag to applications. Applications in the storing unit are identified before [they] (sic) are executed by the kernel unit...Therefore Shiomi’s reference does teach the determination of the kernel process within the kernel unit.” Applicants agree that the identifier providing unit 13c executes in the kernel process of Shiomi and thus the applications are identified by the identifier providing unit 13 in the kernel process. However, the claim language is not claiming that the identification takes place in the kernel unit. The claim language discloses determining whether the process *allocated with* the kernel resources is a user or a kernel process, and not if the identification takes place in the kernel or not.

Based on the above referenced citation in the Advisory action, the Applicants interpret the Advisory action as construing Shiomi’s “application which has requested the resource” as “the process allocated with kernel resources” of amended claim 1. The Applicants also interpret the Advisory action as construing Shiomi’s “application ID” as being “the tag” of amended claim 1. Shiomi’s identifier providing unit 13c is used to identify the application ID of the application which has requested the resource, but does not appear to disclose this identification reflecting whether this application is a kernel or a user process (as recited in the first three elements of amended claim 1). Identifier providing unit 13c merely provides the application ID. The contents and structure of this application ID is not elaborated on in Shiomi; Shiomi is ambiguous on the actual content of the application ID. Indeed, the only examples of application ID structure are in Shiomi’s figures. For instance, Shiomi Figures 5, 19 and 27 have application ID as numbers “1” and “2”. Shiomi does not

appear to disclose varying his application ID based on the determination of whether or not the application which requested the resource is a kernel or a user process.

Identifier providing unit 13c is described under Shiomi's first embodiment. In the other embodiments 2-5 of Shiomi, again only the application ID is mentioned and not a determination or identification of whether or not the application which has requested the resource is a user or a kernel process. Thus, Shiomi does not appear to disclose "generating a tag to charge a process allocated with kernel resources, the tag identifying the allocated kernel resources charged to the process; determining if the process is a kernel process; determining if the process is a user process" as recited by the first three elements of amended claim 1.

With regard to other elements of amended claim 1, Applicants submit that Shiomi does not appear to disclose the elements "the tag identifying the allocated kernel resources" where the tag is flagged "with a user flag bit if the process is determined to be a user process" and the tag is flagged "with a kernel flag bit if the process is determined to be a kernel process." Shiomi's embodiments 1-5 do not appear to disclose a tag flagged with a bit to indicate whether the calling application process is a user process or a kernel process:

Shiomi's embodiment 1 describes a table with each entry containing the application ID and the resource name [0095] with no mention of a bit flag indicating if the application process is a user or kernel process,

Shiomi's embodiment 2 describes tables (Fig. 12 and [0117]) that track resource and application instances with multiple levels of indirection, again with no mention of a bit flag indicating if the application process is a user or kernel process,

Shiomi's embodiment 3 describes tables (Fig. 16 and [0134]) that track application ID, task ID and thread IDs, again with no mention of a bit flag indicating if the application process is a user or kernel process,

Shiomi's embodiment 4 describes a table (Fig. 27 and [0186]) with an application ID and a resource name, again with no mention of a bit flag indicating if the application process is a user or kernel process, and

Shiomi's embodiment 5 describes a divided heap area allocated to an application (Fig. 29 and [0200]) that is mapped to object areas, again with no mention of a bit flag indicating if the application process is a user or kernel process.

Thus, Shiomi does not appear to disclose the elements “the tag identifying the allocated kernel resources” where the tag is flagged “with a user flag bit if the process is determined to be a user process” and the tag is flagged “with a kernel flag bit if the process is determined to be a kernel process.”

With regard to the last elements of amended claim 1, Shiomi does not appear to disclose the elements of amended claim 1 “determining if the process has exceeded a threshold limit of kernel resource usage; and if the process has exceeded the threshold, aborting the process.” In each of Shiomi’s embodiments 1-5, the resources are released when an application is completed or suspended. Shiomi does not appear to disclose the application process ever being aborted, let alone aborted based on exceeding a kernel threshold usage limit. See Shiomi [0104] for embodiment 1, [0112] for embodiment 2, [0123] and [0135] for embodiment 3, [0166] for embodiment 4, and [0190], [0204] and [0214] for application 5. No mention of “determining if the process has exceeded a threshold limit of kernel resource usage; and if the process has exceeded the threshold, aborting the process” appears to be found in Shiomi.

This makes sense as Shiomi is directed to providing a solution for efficiently releasing resources when a requesting application completes or is suspended. The instant application, however, is directed to solving the problem of tracking kernel resource usage and addressing performance issues – thus, the threshold limits and aborting of resource-hogging processes that do not appear to be found in Shiomi. Furthermore, with the indication of user or kernel processes via a flag bit as disclosed in amended claim 1, the usage of resources by requesting processes are able to be filtered by user process or kernel process, and this information may be used intelligently in kernel resource management.

As Shiomi does not appear to disclose at least the elements of amended claim 1:

“generating a tag to charge a process allocated with kernel resources, the tag identifying the allocated kernel resources charged to the process; determining if the process is a kernel process; determining if the process is a user process;”

“flagging the tag with a user flag bit if the process is determined to be a user process” and “flagging the tag with a kernel flag bit if the process is determined to be a kernel process;” and

“determining if the process has exceeded a threshold limit of kernel resource usage; and if the process has exceeded the threshold, aborting the process,”

Applicants assert that Shiomi does not anticipate amended claim 1 and amended claim 1 is allowable over Shiomi under 35 U.S.C. §102(e).

35 U.S.C. §112, ¶4 states that "A claim in dependent form ... specif[ies] a further limitation ... [and] shall be construed to incorporate by reference all the limitations of the claim to which it refers." Therefore, dependent claims 2-7, 9 and 13 incorporate by reference all limitations of amended independent claim 1. Applicants respectfully assert that dependent claims 2-7, 9 and 13 are also allowable under 35 U.S.C. 102(e) at least for reasons similar to those discussed for amended claim 1.

CLAIMS 14-15, 17-24, 30 and 32-33

Independent claims 14, 21, 30 and 32-33 are amended similarly to amended claim 1. Their respective dependent claims are also amended to reflect the changes to the independent claims. For at least the same reasons as discussed for amended claim 1, Applicants assert that amended claims 14, 21, 30 and 32-33 are also allowable over Shiomi under U.S.C. 35 §102(e).

Claims 15 and 17-20 depend from amended independent claim 14, and claims 22-24 depend from amended independent claim 21. Therefore, dependent claims 15, 17-20 and 22-24 incorporate by reference all limitations of their respective independent claims. Applicants respectfully assert that dependent claims 15, 17-20 and 22-24 are also allowable under 35 U.S.C. 102(e) at least for reasons similar to those discussed for their respective independent claims.

CLAIMS 25 and 34

Claim 25 is similarly amended to claim 1. Amended claim 25 presently recites, *inter alia*, the element “including threshold limits of kernel resource usage for each process.” Support for this amendment may be found in the specification 14:23-15:7 and Figure 7.

Claim 25 is further amended to include the elements of original (presently canceled) claim 26.

Applicants assert that Shiomi does not anticipate each element of amended claim 25 for the following reasons.

Regarding the element “a flag bit identifying the process as a kernel process if the process is a kernel process, and the flag bit identifying the process as a user process if the process is a user process,” Applicants assert that Shiomi does not disclose this element for at least the same reasons as previously discussed for amended claim 1.

Regarding the other elements recited in amended claim 25, the Office action, page 11 cites the fifth embodiment of Shiomi [0208]-[0211] as anticipating claim 25 and (presently canceled) claim 26. Shiomi [0208]-[0211] discusses the acquisition of divided heap areas to store objects for an application. Shiomi’s divided heap is defined in [0190] as a portion of memory provided to one application used for storing objects related to the application. Upon request by an application to use an object, a divided heap is attempted to be acquired to store the object in relation to the application.

Shiomi does not appear to disclose the element “aborting the process if the amount of kernel resources used by the process exceeds the threshold limits.” The Office action cited Shiomi [0211] as disclosing this element (previously recited by canceled claim 26). The Applicants disagree for the following reasons: based on this citation, Applicants interpret that the Office action is construing “the amount of kernel resources used by the process exceeds threshold limits” as not enough memory available for a divided heap to store an object requested by the application. However, Shiomi [0211] states that “if the acquisition [of an object area] (see [0209] for antecedent) is not successful, the object area acquiring unit 104a instructs the GC unit 104d to perform garbage collection on the divided heap area.” Shiomi [0211] further states that “while the GC unit 104d is garbage-collecting the divided heap area, the locking unit 104e suspends the execution of the application that uses the divided heap area.” Thus, in Shiomi, if sufficient memory from the divided heap is not able to be acquired for object storage, the application process is *suspended* while garbage-collecting takes place. The application is not aborted, as recited in amended claim 25.

As a further point of clarification, Shiomi’s “garbage-collecting” is defined in Shiomi [0007] as “collecting unnecessary areas in memory.” Thus, the term “garbage-collecting” also does not disclose aborting the application process, as recited in amended claim 25.

This makes sense, as Shiomi is directed to more efficiently “garbage-collecting”, or cleaning up unused resources. Shiomi does not address the issue of tracking/overuse of kernel resources by a specific requesting application. The present application, however, provides benefit over Shiomi by tracking kernel resource usage and addressing performance issues – such as tracking kernel resource usage against kernel resource thresholds and aborting processes that exceed the thresholds. Furthermore, with the indication of user or kernel processes via a flag bit as disclosed in amended claim 1, the usage of resources by requesting processes are able to be filtered by user process or kernel process, and this information may be used intelligently in kernel resource management.

Accordingly, Applicants assert that Shiomi does not disclose at least the elements of amended claim 25 “a flag bit identifying whether the process is a user process or a kernel process,” and “aborting the process if the amount of kernel resources used by the process exceeds the threshold limits.” Amended claim 25 is allowable over Shiomi under USC 35 §102(e).

Claim 34 is amended similarly to amended claim 25. For at least the same reasons as discussed for amended claim 25, Applicants assert that amended claim 34 is also allowable over Shiomi under U.S.C. 35 §102(e).

CONCLUSION

For at least the reasons discussed above, Applicants assert that Shiomi does not disclose or describe all the elements of amended claims 1, 3, 5, 7, 9, 13-14, 21-22, 25, 30 and 32-34. Accordingly, Applicants assert that pending claims 1-7, 9, 13-15, 17-25, 30 and 32-34 are allowable over Shiomi under U.S.C. 35 §102(e). In view of the above amendments, Applicants believe the pending application is in condition for allowance. If the Examiner has any questions or suggestions, the Examiner is encouraged to call the applicant direct at 312-474-6610.

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